American Society for Testing Materials
BULLETIN

ISSUED BI MONTHLY

A Review Number

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CHEMICAL DIVISION

TO SECURE a proper perspective of the activities of the Society in its many ramifications it seems desirable to set forth its major accomplishments and to take stock of its activities from time to time. A review at the close of the year would accordingly seem most appropriate, both to give a birds-eye view of what has been accomplished and to serve as an inspiration for the still bigger things to be accomplished during the coming year. The present number of the BULLETIN is devoted to such a review for 1926.

January, 1927

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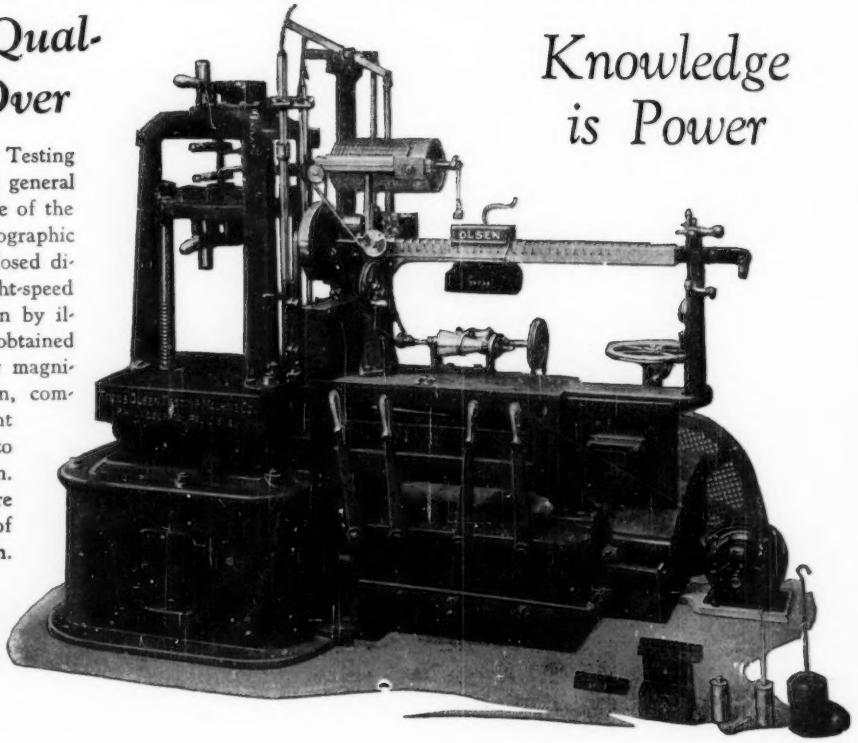

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American Society for Testing Materials

BULLETIN

ENGINEERS' CLUB BUILDING 1315 SPRUCE STREET PHILADELPHIA, PA.

NUMBER 24 JANUARY 10, 1927

The Society During 1926

THE year 1926 was an eventful one for the American Society for Testing Materials. Its technical activities have gone forward with as rapid a pace and have been as productive as at any time in the Society's history. Much of this has been due to its committees for they are the life of the Society. Of these committees there are now 45, a new Committee on Natural Building Stones having been organized during the year. A number have found it necessary to increase their membership in view of the diverse subjects now receiving their attention, the membership of the committees now totalling 2100. An idea of the virility and activity of these committees may be gained from the reports presented at the annual meeting, reports having been received from 36 of the committees.

While the standardization work has not been neglected in any respect, as may be seen from the fact that 54 new standards were submitted as tentative, making the present total of standards and tentative standards 447, greater attention has been paid than at any time heretofore to the promotion of research. Many of the committees have carried on extensive research investigations either in the form of correlative and cooperative tests to settle some feature of its standardization work or as pure investigational work. In addition a wealth of material has been brought out in the technical papers read at the meeting. As a recognition of the efforts put forth in the preparation of these papers and in order to promote the submission of valuable papers the Charles B. Dudley Medal has been established, and the medal will be awarded to the author of the paper deemed of most outstanding merit constituting an original contribution on research in engineering materials. As a further recognition of the importance of research, the Edgar Marburg Lecture has been established during the year for the purpose of having described at the annual meetings outstanding developments in the promotion of knowledge of engineering materials. The first Edgar Marburg lecturer was Dr. Arthur N. Talbot, Professor-in-charge, Theoretical and Applied Mechanics at the University of Illinois and Past-President and Honorary Member of the Society. His subject was, "Research and Reinforced Concrete as an Engineering Material." The medal and lecture were endowed on a permanent basis by the contributions of the members.

The many reports and papers presented at the annual meeting will be issued as usual, together with the discussions thereon, in the form of annual Proceedings. These comprise close to 1900 pages, the second largest in the Society's history. Those standards adopted by action of the annual meeting were issued in the form of a supplement to the 1924 Book of A.S.T.M. Standards, comprising a pamphlet of somewhat over 100 pages. In addition, for the convenience of those desiring them in that form, all of the Tentative Standards were issued collectively in the 1926 Book of A.S.T.M. Tentative Standards, a volume comprising 1100 pages.

It is appreciated that it is not sufficient to merely produce standards or to present results of extensive researches. It is necessary that industry avail itself of this information and benefit by the standardization work by putting it to use. Greater publicity is accordingly being given to the Society's work, through the activities of the Committee on Promotion of Usefulness. This greater publicity is reflected in the increased demand for the Society's standards and other publications. The work of the Society is receiving ever-increasing recognition which to some extent has taken the form of increased membership, since many individuals and institutions are desirous of holding membership in the Society in order to keep in direct touch with its activities. The number of new members during the year was greater than ever before, totalling 537. The net increase in membership was 271, making the membership as of December 31, 4135. This increase in membership is gratifying not only in that it means increased support for the Society's activities, but as evidence to the extent that the importance of the Society's work is appreciated, and, even more significant, that there will be an increased number in a position to put to use immediately the results of its work.

Technical Activities

The tendency in recent years for the technical committees to work in cooperation with other societies was quite marked during 1926. A number of instances may be cited representing not only the work of formal joint committees but instances where the committees have been in communication with corresponding committees of other organizations or where representatives of these organizations have served on the committee. Committee A-1 on Steel is a case in point. Specifications were submitted as tentative during the year as

(*Continued on page 2*)

the direct result of cooperative work such as the specifications for open-hearth steel rails, a revision of the Standard Specifications almost identical with the specifications of the American Railway Engineering Association and of the American Railway Association; the specifications for open-hearth steel girder rails, a revision of the Standard Specifications identical with those recently adopted by the A.R.E.A. and the American Electric Railway Engineering Association; and the new Specifications for Soft Steel Track Spikes, submitted as a revision of the Standard Specifications, now the same as the corresponding specifications adopted by the A.R.E.A. Similarly the Tentative Specifications for Steel Tie Plates have been revised and are now similar to the specifications for tie plates adopted by the A.R.E.A.

Committee B-1 on Copper Wire has also worked in cooperation with the A.E.R.E.A. Its Specifications for Hard-Drawn Copper Trolley Wire are identical with the corresponding specifications of the A.E.R.E.A. and in the case of the Tentative Specifications for Bronze Trolley Wire there is but one difference, relative to the twist test, which is now in process of adjustment.

Committee D-7 on Timber is represented on a joint conference committee with the Preservatives Committee of the American Wood Preservers Association in connection with the endeavors to arrive at one general standard method for the distillation of creosote oil. These methods were submitted as tentative at the last annual meeting by Committee D-7.

The work of the various standing committees as sectional committees of the American Engineering Standards Committee should similarly be recognized as cooperative work. Considerable progress has been made in organizing A.S.T.M. committees as sectional committees. During the year Committee C-1 on Cement has actively been engaged in the formation of such a sectional committee. Committee D-2 on Petroleum Products and Lubricants has been designated a sectional committee on standard methods of test of petroleum products and lubricants. A sectional committee has been organized on zinc coating of iron and steel, of which the personnel of the Sub-Committee on Tests has been made identical with Sub-Committee VII of Committee A-5. Other instances might be mentioned but those given will serve to show how extensive the cooperative work has become.

One of the significant features of the present trend of studies and methods of testing is the attempt to develop and the interest shown in accelerated tests. The best indication of the performance of a given material of course is a direct service test. Such a test, however, is time-consuming and relatively expensive and a satisfactory accelerated test would be in the interest of economy and would expedite the securing of knowledge of materials. The attempt to develop accelerated tests has been extended to many fields including accelerated weathering of paints and protective coatings in general, the aging of rubber products, wear tests of rubber and textile products, weathering of stone and slate, deterioration of concrete aggregates and the fatigue testing of metals.

Corrosion

The accelerated tests in greatest prominence are possibly those dealing with corrosion, since this subject has long held the attention of technicians. Committee B-3 on Corrosion of Non-Ferrous Metals and Alloys has devoted its attention almost exclusively to the standardization of such accelerated tests and a study of the existing tests. The first program outlined by the committee, namely, of studying four types of tests by the use of six different metals and six different solutions, has been completed and the committee is engaged in the summation and evaluation of the resulting data. Similarly, Committee A-5 has been engaged in developing satisfactory accelerated tests for protective coatings for iron and steel. In both committees it is recognized that to make an accelerated test of real value, the results obtained must be correlated with long-time service tests and Committee B-3 plans not only to continue to strive for the improvement of the tests now under consideration but also to proceed with actual long-time service tests. Such long-time tests have, of course, been in progress for some years in connection with the work of Committee A-5, such as the atmospheric exposure of black sheets of different compositions, both copper-bearing and non-copper-bearing. The tests at Fort Sheridan and Annapolis are still in progress and inspections are regularly made and results recorded.

A very elaborate series of tests of metallic-coated products is now under way at five locations, namely, Sandy Hook, N. J., Altoona, Pa., Pittsburgh, Pa., State College, Pa., and Key West, Fla. The sheet and bend test samples of zinc-coated material have been installed at all locations; and the wire, fencing, hardware and fittings samples will be exposed as quickly as they are assembled.

The total immersion tests of steels of various composition at Key West and Portsmouth, N. H., are still being observed and are yielding results which are being reported regularly.

Similarly, a series of tests is being conducted by Committee D-14 on Screen Wire Cloth, and insect screens of various composition are now in position for atmospheric exposure at the Bureau of Standards, Washington, D. C., Bureau of Mines, Pittsburgh, Pa., the Bureau of Lighthouse Depot, Portsmouth, Va., and the Panama Canal. The results of these tests will be correlated with those of accelerated tests that have already been carried out and reported upon at the 1926 annual meeting.

The work on corrosion, however, has not been confined to a study of tests and of the effect of corrosion on various metals, but has reached a point where definite specifications and materials specifically designed for corrosion resistance are being developed. Specifications were presented at the 1926 annual meeting for the Coating on Zinc-Coated Wire; for Zinc-Coated Iron or Steel Telephone and Telegraph Line Wire and for Zinc-Coated Iron or Steel Tie Wires, and other specifications are now in process of development for sherardized sheets. Specifications for galvanized pipe are in a formative stage. The use of chromium-iron alloys was discussed at the annual meeting in a paper by T. H. Nelson indicating the important place corrosion-resistant alloys are taking in engineering design.

Fatigue of Metals

The importance of corrosion as a factor in the fatigue of metals is brought out in two papers presented at the annual meeting, the paper by D. J. McAdam, Jr., entitled "Stress-Strain-Cycle Relationship, and Corrosion-Fatigue of Metals," and the paper by R. R. Moore entitled "Effect of Grooves, Threads, and Corrosion Upon the Fatigue of Metals." These papers, as well as a paper by P. L. Irwin entitled "Fatigue of Metals by Direct Stress," brought out further data in connection with fatigue testing and have been considered as extremely important contributions in this field.

Effect of High Temperatures

Allied to the usual fatigue tests is the long-sustained static test. A study of this type of testing was set forth in a paper by H. J. French entitled "Methods of Test in Relation to Flow in Steels at Various Temperatures." Important data on the properties of metals at high temperatures were brought out in this paper as well as in a paper by S. H. Ingberg and P. D. Sale entitled "Compressive Strength and Deformation of Structural Steel and Cast-Iron Shapes at Temperatures

up to 950° C." The latter paper covers results obtained by two methods, namely, by increasing the load while holding the specimen at a given temperature and by increasing the temperature while the specimen is subjected to a constant load. The data presented are of interest primarily in the estimation of the performance that may be expected from structural shapes of iron and steel under fire conditions. To the specifications, presented in 1925 by Committee A-1 on Steel, for castings and for bolting material for use at high temperatures have been added Tentative Specifications for Forged or Rolled Steel Pipe Flanges for High-Temperature Service, and for Steel Pipe for High-Temperature Service.

Magnetic Analysis and Testing

In recent years considerable interest has been shown in attempts to test material without destroying it. Such a test could be applied to actual parts to be put in service. One direction which this search for a non-destructive test has taken is in magnetic analysis, determining physical properties by means of the electrical and magnetic characteristics. Various forms of apparatus have been developed and considerable progress is represented by the work of Committee A-8 on Magnetic Analysis. It has confined its attentions in its most recent investigation to cooperative tests of high-speed drills. The results of this investigation were presented in the report of the committee for 1926 and in a paper by Thomas Spooner entitled, "The Magnetic Testing of High-Speed Steel." In connection with the presentation of this paper, investigations by other members of the committee were reported upon and presented as discussion as well as a paper by Haakon Styri on "Testing of Ball-Bearing Races by Electric and Magnetic Methods." Supplementary tests are to be made on the high-speed steel samples used in the investigations reported upon, including X-ray tests. A number of new methods of testing are being developed by individual committee members along the lines of magnetic analysis.

The Committee on Magnetic Testing has also been quite active, resulting in the submission at the 1926 annual meeting of new Methods of Test for Magnetic Properties of Iron and Steel. The committee is now formulating a standard magnetic test for sheet steel to be used in radio apparatus such as the cores of audio-frequency transformers, choke coils and the like. It is also preparing a list of symbols and definitions for the more important magnetic properties.

Metallography

Another line of investigation that has proved fruitful in the development of a non-destructive test has been that of X-ray metallography. Much has been brought out on the use of the X-ray for detecting flaws in steel castings, and this year Committee E-4 on Metallography submitted a Tentative Recommended Practice for Radiographic Testing of Metal Castings. This has its application in the development of a manufacturing technique in the foundry, that is in connection with pilot castings, and to the final inspection of the manufactured product, principally in connection with important installations where failure of a casting might have disastrous consequences. A comprehensive list of definitions of terms relating to radiography has been prepared. The committee has continued its work on micro-hardness testing and in the developing of etching reagents and technic for satisfactorily etching the constituents of ferrous and non-ferrous alloys. Part of this work was carried out by E. H. Dix, Jr., and W. D. Keith and a paper on the subject was presented by them entitled "The Etching Characteristics of Constituents in Commercial Aluminum Alloys."

Iron and Steel, General

While mention has been made of some of the standards brought out by Committee A-1 on Steel, other standards have been submitted which should be mentioned. Two new specifications for commercial bar steels, one covering commercial quality hot-rolled bar steels and the other commercial cold-finished bar steels and cold-finished shafting, have been prepared to replace the present Standard Specifications. Specifications for Cold-Rolled Strip Steel were presented, the preparation of which represents a great deal of work in the harmonizing of ideas among manufacturers and consumers.

Specifications for Marine Boiler Steel Plates were developed during the year but it was felt that these were not yet ready for submission. They have received the consideration of a joint committee on which were representatives of bodies most actively interested, and with changes in regard to minor details are coming up for consideration by Committee A-1 for submission in 1927.

The standardization work of Committee A-2 on Wrought Iron has been confined to a review of existing standards and the recommendation of revisions, as for instance in the nomenclature of bar iron. What was formerly termed "merchant bar iron" will now be referred to as "common iron bars," the new designation being more appropriate. The 1926 report of Committee A-2 presented the results of tests that had been carried out on staybolt iron to determine the effect of annealing. This is quite an important subject and one that requires attention and the tests reported represent a very good start on the investigation of this subject.

Committee A-3 on Cast Iron has been engaged in revising its methods of chemical analysis of pig and cast iron and in the study of the test specimens for transverse tests. A modification in the present arbitration bar so as to increase the span over which the bar is broken from 12 in. to 18 in. and so as to decrease the diameter slightly from 1.25 in. to 1.20 in. should result in a test bar universally applicable. Factors for converting results obtained with the present bar to corresponding figures with the new bar have been developed.

Important papers dealing with a test bar for cast iron and the use of test specimens in testing pipe were presented at the 1926 annual meeting by J. T. MacKenzie, and A. N. Talbot and F. E. Richart.

Non-Ferrous Metals, General

Important specifications were brought out by Committee B-2 on Non-Ferrous Metals and Alloys as follows: Tentative Specifications for Aluminum Bronze Castings; for the Alloy: Copper 88 per cent, Tin 8 per cent, Zinc 4 per cent; for Steam or Valve Bronze; for Composition Brass or Ounce Metal; and for Aluminum-Base Sand-Casting Alloys in Ingot Form.

The committee also presented the results of an investigation on the fluidity of white-metal bearing alloys carried out by E. R. Darby and also a discussion on the properties of high-strength aluminum casting alloys, this being a companion discussion to that presented a year or so ago on high-strength light alloys for use in the wrought condition. The committee also presented some important revisions of its tentative specifications and methods of chemical analysis of aluminum and aluminum alloys. It is now engaged in the revision of its specifications for cartridge brass, naval brass rods and copper pipe. New specifications are contemplated for refrigerator tubing, for sheet nickel and for wire solder; for 80–10–10 bronze and for yellow castings; and for aluminum die casting alloys. Specifications for strip zinc are also being prepared for presentation as tentative, proposed specifications having been presented at the last annual meeting. A report is being prepared on the testing of sand-cast aluminum alloys. A paper on this general subject was presented at the last annual meeting by George Mortimer reviewing the British Engineering Standards Association specifications.

The newly organized Committee B-4 on Metallic Materials for Electrical Heating presented with its report a Tentative Method of Test for Resistivity of Metallic Materials for Electrical Heating. The materials which have received the consideration of this committee have almost exclusively been

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AMERICAN SOCIETY FOR TESTING MATERIALS

BULLETIN

Issued Bi-Monthly

Engineers' Club Building, 1315 Spruce St , Philadelphia, Pa.

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Number 24 January 10, 1927

A New Bulletin

When the idea of issuing a news bulletin was first conceived it was hoped that eventually it would be possible to forward to the members periodically the many items of interest that develop in the Society's work of which the membership-at-large should be apprised. At first, in 1921, we were able to issue the BULLETIN at only approximately quarterly intervals and these issues were of only four pages. Since then it has been possible gradually to expand it, confining the articles throughout strictly to Society news, until issues of twelve pages and sixteen pages appeared. A further step has now been made and during 1927 there will be six issues of the BULLETIN each containing a minimum of eight pages of news. A more appropriate cover has been designed and this cover will appear in color, giving to the BULLETIN a distinctive appearance.

A Review Number

The first issue under the new scheme has been devoted to a review of the Society's activities during 1926. Most of the members are familiar in a general way with the range and scope of our many-sided activities. Few of them, however, can keep in touch with the activities of all of the committees, and an attempt has herein been made to set forth the principal accomplishments of these committees during the year, and to give an idea of the problems on which they are now engaged. This has been made possible through the assistance of the committee officers.

The review will be supplemented throughout the year by the usual committee notes. It is planned to make these of even greater interest than heretofore and with more issues available it should be possible to make these notes more timely and more complete. The cooperation of the committee officers will be sought to accomplish this, and the assistance of the individual members would be appreciated in pointing out in what way the news given in the BULLETIN should be amplified.

1927 Book of Standards in Two Parts

Accompanying the bills for dues sent out on January 1 was a notice to the members calling attention to the fact that, in accordance with action taken at the annual meeting last June, the 1927 Book of A.S.T.M. Standards would be published in two parts, Part I covering Metals and Part II covering Non-Metals, and that it would be the policy to furnish to each member either Part I or Part II of the Book of Standards as he might elect. Members desiring the other part might secure a copy for the sum of $2.00. With this announcement went a return card with the request that this be filled out and returned to the Society's headquarters so that a definite record would be in the Society's files of the wishes of the individual members as to how the Book of Standards is to be furnished. It will be a great convenience if those members that have not yet done so will return these cards immediately.

Group Committee Meetings in Philadelphia in March

Plans are now being made for the spring group meetings of our standing committees. It has seemed desirable to hold this series of meetings in the East in view of the fact that the annual meeting will be held for the first time in the Middle West; and the meetings held in Philadelphia in 1924 were so successful that if it meets with the general approval of our committees we will arrange to hold them here again this year. The dates Tuesday, March 15, to Friday, March 18, have been suggested. By beginning the meetings on Tuesday instead of Wednesday, as usual, it will be possible to schedule meetings of the metals and non-metals committees during the same week—a plan that worked very successfully at the last two group meetings held in Cleveland and Providence.

Annual Tables of Constants and Numerical Data

The members are no doubt familiar with the Annual Tables of Constants and Numerical Data published by the International Committee under the patronage of the International Research Council and of the International Union of Pure and Applied Chemistry. Volume V of these annual tables became available a few months ago, constituting a digest of engineering and scientific literature for the years 1917 to 1922. We have recently been advised by the General Secretary, Ch. Marie of Paris, that the portion of Volume V covering engineering and metallurgy has been reprinted. An announcement of this is given in the prospectus enclosed with this BULLETIN.

1926 Proceedings

The Proceedings of the 1926 Annual Meeting are now off press and should be available for distribution within the next few days. The two volumes, Part I containing committee reports and tentative standards and Part II containing the technical papers, will together comprise 1895 pages. They are the largest Proceedings in the history of the Society with the exception of those for 1924 which contained the papers and discussion entering into two large symposiums including one on Effect of Temperature on the Properties of Metals held in conjunction with the American Society of Mechanical Engineers in April of that year. The present Proceedings represent a wealth of material, since all the reports and papers have been condensed to the greatest possible degree to eliminate all non-essential material.

Annual Meeting at French Lick, Indiana

The members no doubt have all noted on their calendars the dates for the 1927 annual meeting. As previously announced, it will be held June 20 to 24, at French Lick, Indiana. The meeting, in addition to the usual attractions of discussions on technical subjects, should afford an excellent opportunity for social intercourse since the members will all be under one roof. There are many scenic attractions at French Lick that will be described in a booklet to be distributed through the courtesy of the hotel management about the end of April. At about the same time the members will receive the Provisional Program of the meeting and cards for hotel reservations. Those who wish to make reservations immediately, however, may do so. The rates, on the American plan, will be as follows:

Single rooms, with bath or connecting bath	$12 per day
Double rooms, with bath or connecting bath	18 " "
Single rooms, without bath	10 " "
Double rooms, without bath	16 " "

These rates will prevail a few days before and a few days after the meeting.

Subsequent issues of the BULLETIN will contain detailed announcements of plans for the annual meeting, including special arrangements for transportation.

Members Invited to Offer Papers

As in past years, the Committee on Papers desires to secure the aid of the entire membership in developing the program of the annual meeting. Any member who wishes to offer a paper on a subject relating to the properties and testing of engineering materials is invited to do so, using for that purpose the return blank accompanying this BULLETIN.

Summary of Papers Necessary.—All offers of papers to receive consideration **must be accompanied by a summary of the proposed paper** sufficiently in detail to make clear its scope and to bring out the features that in the opinion of the author make the paper sufficiently valuable for presentation and discussion at the meeting.

It is also requested that an estimate be given of the size of the paper, for which purpose a place has been provided on the return blank.

Prompt Response Desired.—The Committee on Papers will especially appreciate a prompt response to this invitation, since a Provisional Program will be prepared by the committee shortly after February 23, 1927. All offers **accompanied by a summary and received not later than February 23,** will be considered by the Committee on Papers, but consideration of offers received after that date is entirely contingent upon the condition of the provisional program when the offer is received.

Although conditions involved in the preprinting and distribution of papers necessitates fixing the date for receipt of offers as early as possible, the Committee on Papers appreciates that it is not always possible for an author to know with definiteness so far in advance of the meeting whether an interesting and promising investigation that he is conducting will be ready by June. In such cases members are urged to submit at least a tentative offer by February 23, with an explanation of the situation for the consideration of the committee.

Suggestions for Topics for Discussion

The Committee on Papers will also be glad to have the members suggest desirable topics for discussion at the annual meeting, giving the names of members or others who are qualified to discuss these topics. Space for such suggestions is provided on the return blank.

Schedule of Committee Meetings

DATE	COMMITTEE	PLACE
January 12–14	A-1 on Steel	Philadelphia
January 12	A-2 on Wrought Iron	Philadelphia
January 18	Executive Committee	Philadelphia
January 18	C-1 on Cement	Washington, D. C.
January 18	D-8 on Waterproofing	New York City
January 19	D-4 on Road Materials	New York City
January 20	A-4 on Heat Treatment of Iron and Steel	Washington, D. C.
January 27–28	D-9 on Electrical Insulating Materials	Boston
February	C-8 on Refractories	Detroit
March	D-2 on Petroleum Products and Lubricants	Washington, D. C.
March 11–12	D-13 on Textile Materials	Boston
March 15–18	GROUP COMMITTEE MEETINGS	Philadelphia
April	D-1 on Preservative Coatings	Richmond

New Members to January 1, 1927

The following 39 new members were elected from November 1, 1926, to January 1, 1927, making the total membership 4137.

American Cyanamid Co., H. L. Mead.
American Water Softener Co., H. C. Waugh.
Andrews, S. B. (Chesapeake & Ohio Railway Co.).
Castricum, Martin (The Fisk Rubber Co.).
Direccion General de Obras Publicas Santo Domingo, F. A. Ginebra.
Dorn, G. W. (Student Member—Newark College of Engineering).
Dougherty, S. S. (The Toledo Edison Co.).
Fansteel Products Co., Inc., E. W. Engle.
Fimacor Products Corp., F. T. Paternotte.
Francisco & Jacobus, F. L. R. Francisco.
Gray, H. A. (Morton C. Tuttle Co.).
Gwaltney, E. C. (Morgan Mills, Inc.).
India Tire & Rubber Co., The, L. C. Peterson.
Istituto Scientifico Tecnico Ernesto Breda, L. L. Giovanni.
Kaul Clay Manufacturing Co., The, J. A. Boyd.
Kiler, W. H. (Hercules Powder Co.).
Kosmos Portland Cement Co., Inc., G. L. Kirp.
Long, R. J., Jr. (Public Service Production Co.).
Martin & Co., Charles, R. W. Sluter.
Meyer, R. O.
New Orleans, Port of, Board of Commissioners, S. McC. Young.
New York Air Brake Co., H. W. Hyde.
Philadelphia, City of, Bureau of Highways, J. H. Neeson.
Prutton, C. F. (Case School of Applied Science).
Research Institute for Testing Materials and Building Constructions at Czech Technical University, F. Klokner.
Roanoke, Va., City of, C. L. Watkins.
Runge, Walter (International Combustion Engineering Corp.).
Saybolt, E. W. (E. W. Saybolt & Co.).
Snyder, E. H.
Sociedad Cientifica Argentina, Reinaldo Vanossi.
Sociedad Hispano-Portuguesa de Transportes Electricos, Ricardo Rubio.
Tate, F. H. (*Packing and Shipping*).
United States Foil Co., Ernest Scheller.
University of British Columbia, Dept. of Civil Engineering, W. E. Duckering.
University of Hongkong Library.
University of the Philippines, College of Engineering, A. Melchor.
Wagar, S. J. (Chesapeake & Ohio Railway Co.).
Winnsboro Mills, A. C. Johnstone.
Wood Newspaper Machinery Corp., P. L. Tollison.

Deceased Members

We announce with regret the death of five members.

GEORGE A. DRYSDALE, Metallurgical Engineer, 1279 Westlake Ave., Lakewood, Cleveland, Ohio.
CHARLES E. FOX, Engineer and Architect, 1715 Tribune Tower, Chicago, Ill.
RICHARD J. GIBLIN, Assistant Metallurgical Engineer, Buick Motor Co., Flint, Mich.
W. G. GIBSON, Engineer of Tests, Flannery Bolt Co., Bridgeville, Pa.
A. B. STEEN, The Texas Co., Houston, Tex.

The Society During 1926 (*Continued from page 3*)

nickel-chromium and nickel-chromium-iron alloys. Considerable progress has been made in developing an accelerated life test to determine the durability of wire at high temperatures in service. A method of test which will show the change of resistance with temperature is being prepared.

Cement and Concrete

One of the outstanding accomplishments of Committee C-1 on Cement during the year was the revision of the Standard Specifications and Tests for Portland Cement resulting in the adoption of new specifications. The principal changes involved are the elimination of the specific gravity requirements and the increase in the tensile strength requirements both at 7 and 28 days. The committee is looking into the possibility of substituting a new test for the present tensile strength test. This would consist in what is known as the fluid cement water mixture which would become the criterion of the concrete-making value of portland cement. Compression tests are made on neat cement mixes with about 40 to 50 per cent of water by weight and poured into molds. This has received the study of the committee during the past few months and further tests of a cooperative nature will be carried out for the purpose of furnishing a basis for possible strength requirements.

Portland cement has received considerable intensive study. An extensive research program is being carried out at the U. S. Bureau of Standards under the fellowship established by the Portland Cement Association. The progress and significance of this program was brought out in a paper by R. H. Bogue entitled "Portland Cement Research."

Concrete is likewise receiving considerable attention, principally in connection with the problems attending the preparation of specifications for concrete. These problems were discussed in a paper by Cloyd M. Chapman. Committee C-9 on Concrete and Concrete Aggregates is at work on several of the phases involved, such as the formulation of satisfactory specifications for aggregates including a study of the weathering resistance of aggregate materials. Tests are being conducted to show the effect of freezing and thawing on concrete and an endeavor is being made to develop tests to eliminate aggregates that would produce unsound concrete.

A study is also being made on deleterious substances in concrete. This study includes an investigation on the use of dirty stone as coarse aggregate and the effect of sodium silicate on fluid neat cement pastes and on tests of mortars made with washed standard sand.

The possibility of using the transverse test as the standard for testing concrete is being investigated. Tension tests of concrete are also receiving the attention of the committee. A paper on this subject was presented in 1926 by A. N. Johnson. Other papers of interest are the paper by L. C. Stewart entitled "Effect of Calcium Chloride on Transverse Strength of Concrete Cured at Various Temperatures," and one by H. J. Gilkey entitled "The Autogenous Healing of Concrete and Mortars."

Lime and Gypsum

The work of Committee C-7 on Lime has been confined for the most part to a review of its specifications and methods of testing and in a study of plastering using various kinds of lime and aggregates. A number of test panels were erected at the U. S. Bureau of Standards and the condition of these has been reported upon. The committee feels that the question of plastering and the methods employed is a very important one and should receive further consideration in the committee.

Specifications for plasters, or for the gypsum entering into them, have been submitted by Committee C-11 on Gypsum. These are for gypsum molding plaster, gypsum pottery plaster and Keene's cement. The committee is continuing its investigation of the use of gypsum and anhydrite as a retarder in portland cement.

Brick, Tile, Refractories, and Fire Tests

Committee C-3 in addition to its work on specifications and definitions for brick and its work on the promotion of knowledge of brick work will inaugurate research on weathering and porosity of brick.

The principal activities of Committee C-6 on Drain Tile have been in connection with an investigation of the effect of alkali soils on concrete drain tile. The standard specifications for drain tile do not contain any very definite test methods or standard requirements as to the chemical or mineralogical constitution of the materials (burnt clay or concrete). It was recognized at the time that this was an omission that ought to be remedied as soon as scientific research could be carried on to develop reliable and reasonable methods and standards. Consequently, the committee has been engaged for several years in promoting and coordinating a number of researches in this general line. The resistance of concrete to alkali and acid soil condition attack has been the main subject of these researches.

These researches have not as yet developed laboratory tests and requirements which the committee feels should be adopted, but work is being continued with considerable activity.

The standard sand bearings for drain tile have been investigated by D. G. Miller and P. G. McGrew and the results of the investigation reported in a paper entitled "Determination of Pressure Distribution on Circular Pipe when Tested in the A.S.T.M. Standard Sand Bearings."

Committee C-10 on Hollow Masonry Building Units has reviewed its specifications for hollow tile for various purposes and has submitted revisions of these specifications, principally in connection with the expected performance requirements in the fire test.

Committee C-5 on Fire Tests of Materials and Construction has been in close touch and cooperation with the Sectional Committee under the American Engineering Standards Committee that has formulated specifications for fire tests of building construction and materials. The proposed standard has been presented as a tentative specification of the Society and has been submitted to the A.E.S.C. and adopted as a Tentative American Standard.

Committee C-8 on Refractories has continued its survey of the use of refractories in various industries. In 1925 industrial surveys were reported upon in the malleable iron industry and in by-product coke ovens. This year the surveys reported are for the copper industry, for the lead industry and covering the open-hearth practice. Industrial surveys covering boiler furnace conditions, the zinc industry, and the lime and cement industries, are in progress or contemplated.

The committee submitted a revision of the tentative test for spalling action. This test was also discussed in a paper by M. C. Booze. An investigation of a somewhat modified spalling test is in progress at Mellon Institute, in which the brick samples are clamped in a metal frame which forms the roof of a furnace. The brick samples are first heated as the roof of a furnace. Then by means of an auxiliary device the roof may be removed and the brick cooled by an air blast. Alternate heating and cooling is thus provided as in the present tentative method, although results much more comparable with actual service conditions are expected.

The work recently completed by the Bureau of Standards on the softening temperatures of pyrometric cones, has indicated the necessity of not only standardizing on a method for making these determinations, but also the necessity for a standard furnace for this purpose. Natural gas, producer gas, oxygen-acetylene gas in combination, and electrically heated furnaces are being studied in this connection, and the committee hopes to be able eventually to recommend a definite piece of equipment to use for its standard softening test.

Since the tentative slag test has been discontinued, the Bureau of Standards has undertaken a study of the factors affecting the slagging of brick. This will involve a determi-

nation of mineralogical changes, equilibrium conditions, rates of solution and the properties of resultant glasses and slags formed at elevated temperatures with known mixtures of the basic oxides existent in fireclay refractories and in the products of combustion of coal and oil. This fundamental data is necessary before a standard test can be adopted.

Paints, Oils and Naval Stores

Committee D-2 on Petroleum Products and Lubricants presented two new methods of test, one for the thermal value of fuel oil and one for the burning quality of mineral colza oil. The results of a number of collaborative tests were reported, principally upon sulfur determination and demulsibility. A committee is preparing a report on application of tests which should be of value to those who use A.S.T.M. methods for testing petroleum products and lubricants in that it contains detailed information on the nature and applicability of the methods and on the interpretation of results. Standard forms of specifications for fuel oil for domestic purposes are being prepared.

Committee D-1 on Preservative Coatings for Structural Materials presented a very important report, the principal items of interest which might be enumerated being the work on linseed oil specifications and the cooperation with the Federal Specifications Board and the American Engineering Standards Committee to work out a single set of linseed oil specifications suitable for the entire industry. The committee has been and is doing some valuable work on analytical methods for paint and paint materials which will be of great assistance to the industry in the examination of such materials in connection with purchasing under specifications.

Specifications for shellac and shellac varnish are under way and the committee is continuing to work on specifications for pigments. In this way most of the common pigments used in the paint industry will be covered.

The committee has done some research work of great interest and scientific value. One of an outstanding nature is the study of color measurement, where the color of paint from materials has been analyzed in absolute units so successfully that from a plotted curve of a color it has been possible to reproduce the color without ever having seen it. Two very active groups in the committee are working on cellulose ester coatings and on varnish, respectively. In studying these, methods of analysis and test, materials and formulas, and all questions of interest are being considered.

In line with this work papers were presented at the 1926 annual meeting by J. McE. Sanderson, entitled "Mechanical Testing and Recording of the Drying of Paints and Varnishes," by G. W. Rundle and W. C. Norris, entitled "The Study of Nitrocellulose Lacquers by the Stress-Strain Method," and by R. L. Hallett, entitled "Hiding Power of Pigments."

Committee D-17 on Naval Stores was organized to develop specifications and methods of test for turpentine, rosin, wood tars, pitches and pine oils. The committee has started with rosin and is engaged in working out methods for the determination of melting point, dirt, ash and moisture. It will then proceed to the development of methods for the accurate determination of the other physical and chemical constants of rosin and methods for the determination of its suitability for special uses.

As a beginning in this line of work the Society held last June a Symposium on Rosin for the purpose of developing the critical needs of the numerous industries using rosin in their processes. The papers and discussion entering into this symposium have been of decided help in familiarizing users and producers of rosin with its qualities and characteristics, the needs of users and the difficulties of the producers.

Coal and Coke

Committee D-5 on Coal and Coke presented in its 1926 report revisions of the methods of tests of standards under its jurisdiction. In addition to the methods heretofore reported upon it is investigating methods of test for agglutinating value of coal, the interpretation of such methods in terms of properties of coal desirable for specific purposes such as coke making, gas production, and its action on grates.

A thorough investigation is being made of methods of collecting representative samples of powdered coal from unit pulverizer systems. A report was presented on standard sizes for anthracite coal and a number of screening tests have been conducted on anthracite as well as experimental work in regard to collection of samples for the screen test.

Timber and Timber Preservatives

The outstanding feature of the work of Committee D-7 on Timber during 1926 was the preparation and presentation of rules for grading structural timbers. These are intended to replace the specifications for both yellow pine and Douglas fir. The rules are being carefully reviewed with a view to having them in shape for adoption during the coming year. They are the outcome of some 20 years' continuous work and it is expected that with the use of them engineers and architects will be in a position to intelligently specify timber used for structural purposes.

For some years the committee has had under way investigations as to methods of analysis of creosote oil, and methods have been adopted including a method for distillation presented in 1926. It is the purpose of this year's work to review the various methods presented with a view to their unification.

Waterproofing

Committee D-8 on Bituminous Waterproofing and Roofing Materials presented a number of revisions of specifications and methods and submitted seven new specifications and one new method of test, the specifications for the most part being for tars, pitches and roll-roofing. The method of test covers the steam distillation of bituminous protective coatings. One of the outstanding accomplishments of the committee during the year was to bring about closer working relations between the Society and the Federal Specifications Board, the U. S. Bureau of Standards and the Fire Underwriters' Laboratories. Not only has the contact between these organizations proved to be most cordial but it has also brought about the unification in their respective specifications for roofing and waterproofing products.

Slate and Building Stone

Committee D-16 on Slate is enlisting the support of producers of slate and of architects and engineers in its work. It has held its meetings in the slate-producing sections of the country and in connection with meetings of engineers. The committee is cooperating with the navy yard at Norfolk in making tests of the atmosphere for the determination of sulfur content with the idea of determining what action such conditions may have on various building materials.

The committee is planning to submit tentative methods of test for electrical slate. These will include not only methods of test in laboratories and shops but special methods for testing slate in the quarry and in the mill to determine that the slate is suitable for electrical insulation, before it has been shipped or milled for that intended use.

A new committee, Committee D-18 on Natural Building Stone, was organized during the year. It has for its purpose the accomplishment of very important work that will be of considerable service to the architect and engineer. Its program includes the development of uniform nomenclature applying to the stone industry, the determination of chemical and physical properties as affecting the structural stability and weathering, effect of external agencies, standard methods of determining thermal properties and fatigue of stone, development of specification requirements, names and definitions for stone finishes, determination of structural integrity of stone after subjection to fire, preservation and maintenance of old stone structures and the resistance to abrasion under various conditions of use. As a first step existing data is being compiled.

Electrical Insulation and Rubber

Committee D-9 on Electrical Insulating Materials has carefully reviewed its various methods and has submitted revisions of a number of them.

Two new sections were added to the Methods of Testing Untreated Insulating Papers covering a method to determine electrical conductivity and a method of test for acidity. A description of a new multiple electrode form of tape tester was added to the Method of Testing Sheet and Tape Insulating Materials for Dielectric Strength. A compilation is being made of abstracts of published articles on methods of test to indicate deterioration of sheet insulating materials. This is preliminary to the development of methods of test for deterioration. Work has been started on the development of methods of test for varnished cambric tape. A study has been made of water absorption in testing laminated sheet insulating materials. A bend test for flexibility has been outlined, the test machines required having been made by six laboratories and the program of comparative tests is being carried out.

New Methods of Testing Electrical Insulating Oils submitted in 1926 are more explicit than the former standard methods. Furthermore they are applicable to both new and serviced insulating oils. During the year the committee has been actively engaged in research on the development of a proper method for determining the acidity of insulating oils. There has also been performed a large amount of interlaboratory work on the development of the sludging test. During this investigation many of the proposed foreign tests were studied as well as tests proposed in this country.

A method to determine the resistance to impact of insulating materials was submitted this year. A discussion of impact testing appears in a paper presented by W. W. Werring entitled "Impact Testing of Insulating Materials." It is planned to apply this test to porcelain as well as to molded insulation. Work is also being carried out on a porosity test which will permit of quantitative determinations.

The activities of Committee D-11 on Rubber Products on performance tests for rubber and aging tests have been continued. In connection with the development of the flexure tests for rubber belting seven machines built to the requirements of the committee have been installed. Attempts are being made to correlate the results of these tests with service tests. So far the machine has proved of definite value for development work.

A comparison of relative abrasion resistance of two compounds on a large number of abrasion machines was carried out and a further research program is under way in order to correlate machine tests with service tests.

Textiles

The activities of Committee D-13 on Textile Materials cover an ever-increasing field. Its work has received considerable recognition and a large number of technical experts have wanted to take part in the committee's activities so that the committee has rapidly grown until now it is the largest committee of the Society. Its standardization work has kept pace and this year new specifications have been brought out for tolerances and test methods for rayon and for electrical silk and cotton tapes. Work is being undertaken on woolen and knit goods and on cords. The committee is considering the standardization of some analytical chemical tests that are extensively used in the chemical industries for the purpose of bringing about a uniform practice in applying these tests. It is also considering the writing of specifications as its work has advanced to a point to warrant specifications for those mechanical fabrics in common use.

Methods of Testing and Nomenclature

Committee E-1 on Methods of Testing has made considerable progress in its work in the coordination of test methods. It has emphasized the importance of studying methods from a fundamental viewpoint to ascertain what information a given test method develops in regard to a given material and also to learn the limitations of a given test method. As an illustration of the study that should be given to any individual test a report was presented this year on refractive index. A number of sub-committees are at work on studies of this kind. A definite report of progress was presented by one of these on tension testing of thin sheet metals. The various specimens now in use have been tabulated and it is an endeavor of the committee to arrive at one standard test specimen that may replace the score of specimens now used. The same subject is discussed in a paper by R. L. Templin entitled "Effect of Size and Shape of Test Specimen on the Tensile Properties of Sheet Metals."

To handle the subject of the usual compression and tension tests in a manner similar to the tension tests of thin sheet metals, special committees are being organized.

A number of interesting papers dealing specifically with testing apparatus and test methods were presented at the last annual meeting including such papers as the following: "A New Type of Mirror Extensometer," by M. F. Sayre; "A New Twist Meter for Torsion Tests," by J. H. Smith; "A Simple Device to Obviate Capping of Concrete Specimens," by W. F. Purrington and James McCormick; "Effect of Size of Paving Brick on Rattler Loss," by F. H. Jackson; "Can the Hardness of Materials be Neglected in Granulometric Sieve Analyses?" by H. P. Hollnagel and E. A. Harty; and "Measurement of Consistency as Applied to Rubber-Benzene Solutions," by W. H. Herschel and Ronald Bulkley.

Committee E-8 on Nomenclature and Definitions has continued its work of reviewing the various definitions of the Society and it has suggested a number of improvements in form and wording to the standing committees concerned. Sub-committees have been at work on definitions relating to cementitious materials, on sand and aggregate, and on concrete. More recently definitions for brick, slate, metallography and of terms relating to heat treatment have been referred to them for consideration.

Research

Under the jurisdiction of Committee E-9 on Correlation of Research a research committee has been organized on yield point of structural steel. This committee is now obtaining data from its first series of tests on effect of speed of testing. The Joint Research Committee on the Effect of Temperature on the Properties of Metals has been somewhat enlarged and data is now being reported from its first series of cooperative tests.

Committee E-9 has been obtaining opinions from various technical societies and from government bureaus concerning the advisability of a general investigation on the subject of mineral aggregates, covering their use in concrete, in ballast, in filter beds, etc. It would appear that there is considerable demand for such an investigation.

There has been formed recently a joint research committee on welded pressure vessels. The Society is keeping in touch with this work through appointed representatives.

Committee E-9 has reviewed the whole field of research and investigative work being carried on by the Society either through its committees or jointly with other bodies, and has indexed these research projects. At the annual meeting last June it reported 41 projects being administered by our standing committees, two by specially appointed research committees and four by joint committees. The Society is also participating through representation in some ten other investigations. In addition to the 41 specific projects above mentioned there are many investigations being conducted by certain committees that are devoting their major attention to methods of testing, but which investigations do not lend themselves to listing as specific projects. In the aggregate the investigative work of our committees is of considerable magnitude and truly impressive.

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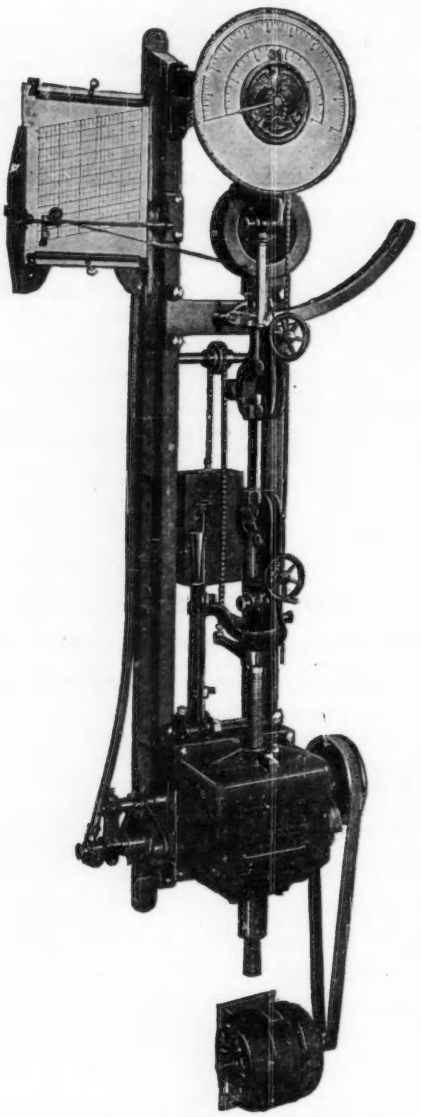

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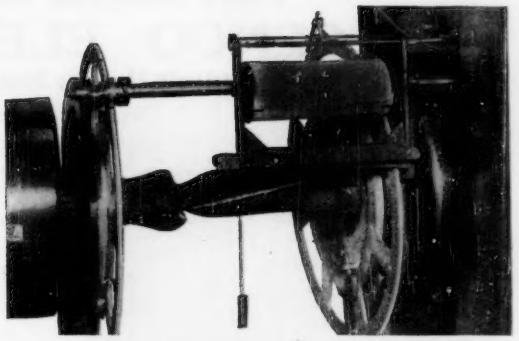

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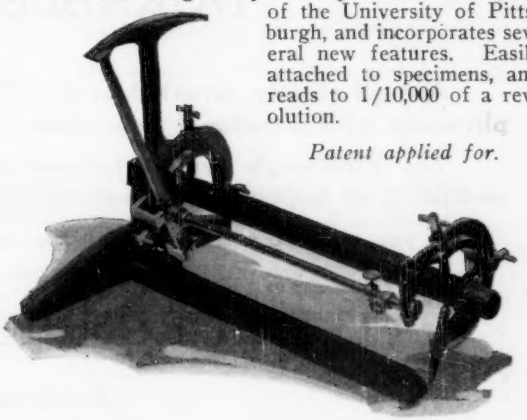

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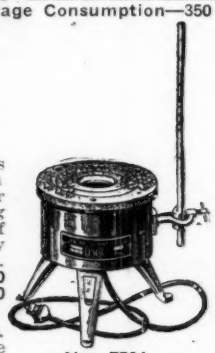

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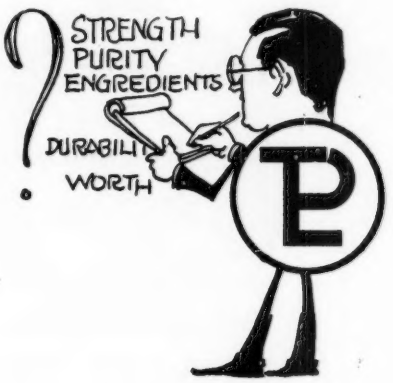

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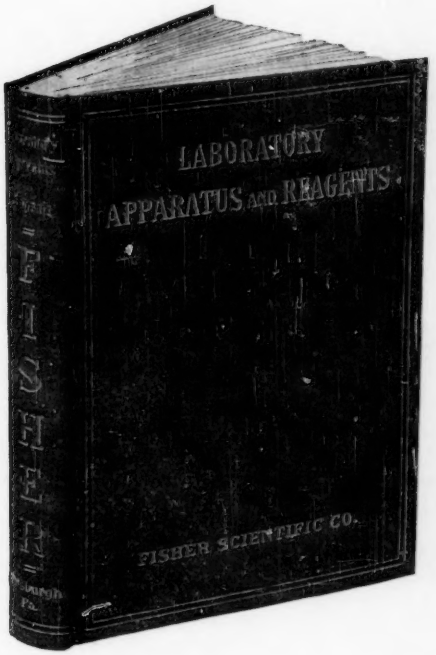

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